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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/039,942

01/03/2002

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03/10/2005

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EXAMINER

SEMENENKO, YURIY

ART UNIT

PAPER NUMBER

2841

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/039,942	LEE ET AL.	
	Examiner	Art Unit	
	Yuriy Semenenko	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/19/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6 pages 4/902</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species 1 in the reply filed on 10/19/2004 is acknowledged. The traversal is on the ground(s) that:

1. Examiner has not stated the reasons relied on for holding that inventions as claimed are distinct.

2. A search of the claims read upon provisionally elected species or embodiments of Species 1, drawn to parts bonded by pins, will necessarily encompass a search relating to species or embodiments of Species 2, drawn to parts bonded temporarily or permanently.

3. Third, . . . because the Examiner has failed to show that there would exist a "serious burden" on the Examiner if all of the claims were examined together in one application.

This is not found persuasive because:

The claims are subject to an election of species. In such a case, the mere identification of the species is considered sufficient, and the species are presumed independent.

Therefore, no further explanation or proof is necessary.

The criteria for making a proper election requirement is that there species are distinct. If so, restriction for examination purposes as indicated is proper. Where there is no disclosure of relationship between species (see MPEP § 806.04(b)), they are independent inventions and election of one invention following a requirement for restriction is proper even though applicant disagrees with the examiner.

The requirement is still deemed proper and is therefore made FINAL.

Priority

2. The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application); the disclosure of the invention in the parent

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application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

Claim 1 of the current application 10039942 includes new limitations, – “an etched hole-fill stand-off”, “tooling plate contacting the etched hole-fill stand-off.” These features are not recited in specification of the parent nonprovisional application 09/752,629 (now Patent #6,454,154, 09/12/2002). The “ etched hole-fill stand-off” and “tooling plate.” are new subject matter. Therefore, they are entitles to the filing date of the present application of 01/03/2002.

Information Disclosure Statement

3. The references cited in the information disclosure statements (IDS) filed on 4/9/2002 and 6/25/2002 have been considered by the examiner.

Drawings

4.1. Drawing are objected to, because Fig. 2 is illegible. The scanned copy of Fig. 2 is completely unreadable.

4.2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “31” has been used to designate both “tooling pins” and “copper layers” . Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5.1. The abstract of the disclosure is objected to because the sentence “A method of filling holes in substrate....” (line 8) is not succinct. Subject of this application is an assembly (product), not a method of making assembly. Correction is required. See MPEP § 608.01(b).

5.2. The disclosure is objected to because of the following informalities: page 4 line 5 “tooling pins 31” and “copper layers 31”. Different parts with same number. Appropriate correction is required.

Claim Objections

6. Claim 1 objected to because of the following informalities: line 2 – “standoff”, line 3 – “stand-off”. Specification page 2, line 27 – “stand off”. Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7.1. Claims 1-4, 8 are rejected under U.S.C. 103(a) as being obvious over S. Kawakami et al. (Patent #5191709) hereafter Kawakami in view of J. Frankeny et al. (Patent # 60982820) hereafter Frankeny.

7.1.1. Regarding claim 1: Kawakami discloses assembly Fig. 1 includes hole-fill stand-off 10, a tooling plate 9, contacting the hole-fill stand-off, the stand-off and tooling plate is aligned to each other. A device 30 (Fig. 2) having holes 34 and 35 to be filled removably contacting the stand-off 48. The stand-off and device are aligned to each other. The device 30 and stand-off 48 each having at least one hole 50 and 34 respectively. The hole 34 of the device 30 is aligned with the hole 50 of the stand-off 48 (column 6, line 34-36).

However Kawakami does not necessarily teach that stand-off 10 is etched hole-fill stand-off.

Frankeny teaches to fabricate structure Fig.17, which can be using as stand-off. Holes 34, 36 (Fig. 17) of this structure are created by etching copper 26, 29 (Fig. 17) and dielectric 6 (Fig. 4) (column 4, lines 10-20). At time the invention was made, it was well known using etching process as relatively not expensive process to achieve uniform dimensions of the holes and vias.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Kawakami to include etched hole-fill stand-off in his invention as taught by Frankeny because benefit of doing so low cost to making stand-off.

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7.1.2. Regarding claim 2: And further, Kawakami as modified teaches the assembly of claim 1, wherein the hole 11 (Fig. 1), of stand-off 10 is larger in diameter than the hole 5 of the device 1, as recited Kawakami (column 4, line 19-21)

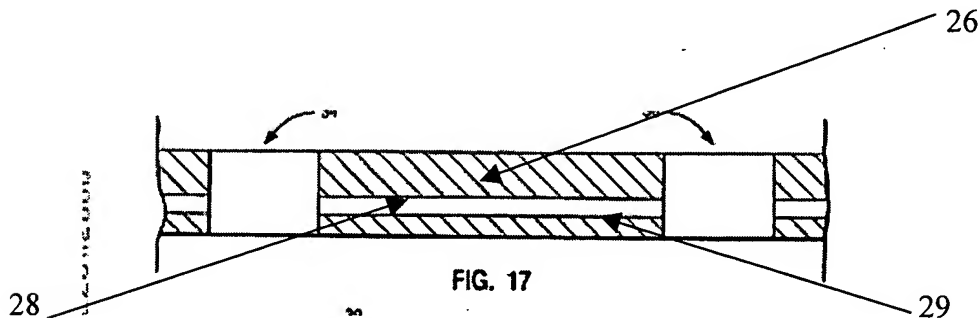
7.1.3. Regarding claim 3: Kawakami as modified teaches the assembly of claim 1, wherein the device 30 comprises a plurality of holes 34,35 to be filled and stand-off 48 comprises a plurality of holes 50, 51. The each holes to be filled of the device 30 is aligned with a hole of the stand-off 48 (column 6, lines 34-36).

7.1.4. Regarding claim 4: Kawakami teaches the assembly (Fig. 1) as discussed above with respect to claim 1 comprising stand-off and device and the layer of the stand-off being in direct contact with the layer of the device.

However Kawakami does not necessarily teach that stand-off 10 comprises an external copper layer and the device comprises an external copper layer.

Frankeny teaches the device comprises an external copper layers 26 and 29 (see below, Fig. 17). At time the invention was made, it was well known to use copper as external layer for printed wiring board (PWB).

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Kawakami to include in his invention that the stand-off comprises an external copper layer and the device comprises an external copper layer, the layer of the stand-off being in direct contact with the layer of the device to provide good support a substrate during filling .



7.1.5. Regarding claim 8: Kawakami discloses as shown on Fig. 2, at least one hole 35 of the device 30 is filled with a fill material 8 that extends partially into a hole of the stand-off 48 without contacting the stand-off.

7.2. Claims 5, 9-11 are rejected under U.S.C. 103(a) as being obvious over Kawakami in view of Frankeny in further view of I.Kenichiro et. al., (Patent # 01-173696) hereafter Kenichiro.

7.2.1. Regarding claim 9: Kawakami as modified, discloses in Fig. 1 the assembly 14 having all of the claimed features as discussed above with respect claim 1. And particularly, the assembly 14 comprising an etched hole-fill stand-off 48.

However, Kawakami doesn't necessarily teach the stand-off comprising an etched layer bonded to a non-etched layer.

Kenichiro teaches the stand-off 1 comprising an etched layer 11 bonded to a non-etched layer 4. At time the invention was made, it was well known to bond one layer to another to create laminated board.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Kawakami to include in his invention that the stand-off comprising an etched layer bonded to a non-etched layer to provide rigid stand off with necessary holes in it.

7.2.2. Regarding claim 5: And furthermore, Kawakami as modified discloses in Fig. 1 the assembly having all of the claimed features as discussed above with respect claims 1 and 4.

However, Kawakami doesn't necessarily teach the at least one hole of the stand-off extend only through the external copper layer.

Kenichiro teaches at least one hole 13 of the stand-off 1 extend only through the external copper layer 11. Frankeny also discloses to provide holes as 39 and 41 (Fig. 19) need use selectively covered by photolithographically processed mask 33 Fig. 16. At time the invention was made, it was well known using etching process to create different type of holes in laminated board.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Kawakami to includes at least one hole of stand-off extends only through the external copper layer of the stand-off in his invention to provided more rigid of stand-off.

7.2.3. Regarding claim 10: And further, Kawakami as modified, teaches the assembly with all limitations claimed in claim 9 and claim 5. The etched hole-fill stand-off comprises a copper clad laminate having a dielectric layer laminated between a first and second copper layer, as discussed above with respect claim 5. At least one hole of the stand-off that is aligned with the a least one hole of the device to be filled is etched through the first copper layer, but not through either the dielectric layer or second copper layer as discussed above with respect claim 5.

7.2.4. Regarding claim 11: Kawakami as modify, discloses in Fig. 2 the assembly having all of the claimed features as discussed above with respect claims 1 and 9, further comprising: a tooling plate, contacting the non-etched layer of the etched hole-fill stand-off 10 (as Frankeny and Kenichiro teach), the stand-off and tooling plate are aligned to each other. A device 30 (Fig. 2) having holes 34 and 35 to be filled removably contacting the etched layer of the stand-off 48, the stand-off and device are aligned to each other. The device and stand-off each having at least one hole 50 and 34 respectively. The hole 34 of the device 30 is aligned with the hole 50 of the stand-off 48 (column 6, line 34-36). The hole of the stand-off having a larger diameter than the hole of the device, as Kawakami discloses (column 4, line 19-21).

7.3. Claims 6, 7 are rejected under U.S.C. 103(a) as being obvious over Kawakami in view of Frankeny in further view of O.Steijer et al. (Patent # 5985185) hereafter Steijer.

7.3.1. Regarding claim 6: As discussed above with all the features of the claim as applied to claim 1 Kawakami discloses assembly Fig. 1 in which the device , the hole-fill stand-off and tooling plate are aligned to each other (column 6, line 34-36).

However, Kawakami does not necessarily teach that a first set of pins aligns to stand-off to the tooling plate and a second set of pins aligns the device to the stand-off.

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Steijer discloses positioning pin 85 and corresponding holes 87 (Fig. 1,2) for aligning two parts of devices (column 7, line 52-53). At time the invention was made, it was well known using pin-in-hole technology for aligning module with circuit board.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Kawakami to include a first set of pins aligns to stand-off to the tooling plate and a second set of pins aligns the device to the stand-off. The benefit of doing so is to achieve a good accuracy in positioning of stand-off and device and tooling plate.

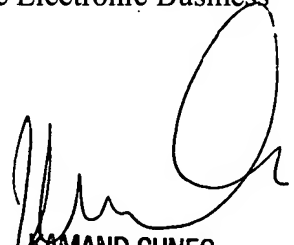
7.3.2. Regarding claim 7: And further, Kawakami as modified, with all limitations claimed in claim 6, teaches the stand-off 10 (Fig.1) rests on but is not bonded to tooling-plate 9 other than by the pins aligning the stand-off and the tooling plate, and the device 1 rests on but is not bonded to the stand-off other than by pins aligning the stand-off and the device.

8.1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuriy Semenenko whose telephone number is (571) 272-6106. The examiner can normally be reached on 8:30am - 5:00pm.

8.2. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571)- 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

8.3. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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